Journal of Economics and Sustainable Development
ISSN 2222-1700 (Paper) ISSN 2222-2855 (Online)
Vol.4, No.13, 2013
www.iiste.org

Effects of Dengue Incidence on Socio-Economic Status of Patient's Family: A Comparative Analysis of Multan and Lahore City (Pakistan).

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Abstract:
Pakistan is one of the victimized countries where the eruption of Dengue fever has been brazed out like several other countries around the globe. Dengue belongs to the family Flaviviridae (one of the families of mosquitoes) and it resembles with Yellow Fever virus and Hepatitis C virus (HCV). This research paper illustrates the effects of Dengue incidence on socio-economic status of the Dengue victims family by exploring the assorted effects related to socio-economic conditions and behavioral amendments of the Dengue patients in Punjab province (Pakistan). A sample of 200 Dengue victims was identified by using Multistage sampling technique from the selected regions of Multan and Lahore city. Interview schedule was used as a tool for data collection process for evaluating the responses of the Dengue victims. It was inferred from this research that the socio-economic status of the people of Punjab was disturbed due to Dengue incidence. Afterward the researcher made a comparison between the socio-economic status of the people of Lahore and Multan city. Subsequently the researcher instituted that the socio-economic status of the people of Lahore city was disturbed drastically as compared to the people of Multan city. The researcher put forwarded that government should ensure community involvement and timely management in removing mosquitoes breeding sites. In addition to this elimination of mosquitoes in Dengue outbreak areas by using premium quality insecticides can also eradicate various dilemmas related with eruption of Dengue fever.
Keywords: Dengue fever, Socio-economic status, Behavioral changes, Timely management, Dengue victims, Insecticides and Community involvement.

1. Introduction:

1.1 Dengue Fever: Occurrence, Causes and Symptoms:

Dengue fever is an epidemiological disease that is closely related to symptoms of yellow fever (Paul, et al. 2001). Aedes Aegypti virus belongs to the family unit "Flaviviridae" which is closely related to West Nile virus. Dengue viruses are transmitted by mosquitoes of Aedes Aegypti species in rural and urban areas of various underdeveloped countries (Nguyen, et al. 2011). Dengue virus is transmitted by the bite of infected female mosquito. This mosquito is widespread in various tropical areas (Carrasco, 2011; Kurane, 2010). Spreading of Dengue fever is influenced by numerous factors (including humid places) which influences the breeding of mosquitoes (Khun and Manderson, 2007; Shamim, 2010; Steuer, et al. 2011). Despite this fact the medical symptoms of Dengue fever ranges from mild fever to Dengue Haemorrhagic Fever (DHF) and Dengue Shock Syndrome (DSS) (Carrasco, 2011). Dengue vector can be controlled through community participation by the usage of knowledge about water storage, treatment strategies (Hsiu-Hau, et al. 2005), vessel emptying (Salahuddin, et al. 2005) as well as cleaning and covering (Morrison, et al. 2004). In behavioral changes people can eradicate vector breeding sites from foremost areas that have continuous usage of water (Gibbons and Vaughn, 2002; Jamil, et al. 2007) especially when the people unfilled those pots from piped water vessels (Barrera, et al. 1993). Mosquitoes occurrence in water storage vessels is an eventual possibility that can be lessen by emptying those containers (Guzman, et al. 1990). Through empting procedure, this will be much effective in reducing vector breeding sites before various stages of immature mosquito's development. Therefore from an environmental aspect, emptying the vessels and associated behaviors may create interest with situation and it affects the development, food availability and climatic changes (Chan, et al. 1995; Guzman and Kouri, 2002; Jelinek, et al. 1997).

Dengue is the big predicament for the people who live in the sticky and subtropical regions. There are millions of people who are affected severely by the Dengue fever. According to one estimate Dengue fever is responsible for more than 26,000 deaths per year worldwide. The increase in mortality rate is caused by four Dengue virus serotypes that are transmitted by the virus known as Aedes Aegypti (Nguyen, et al. 2011). The major symptoms of Dengue fever are headache, fever, bleeding, muscular problem, joint pain and Dengue Hemorrhagic Fever (Jelinek, et al. 1997). There are numerous studies on the ecological perspective regarding Dengue fever but only few studies address maternal and fetal consequences during pregnancy (Basurko, et al. 2008). This palpable evidence (derived from many cases of Dengue fever patients) has been proven (Joshi, et al. 2006). Dengue fever is at its peak in the 21st century due to illness and death rate of human population. Dengue fever has symptoms of viral sickness that becomes deteriorating for the heath of patients (Almeida, et al. 2009; Suaya, et al. 2009). These symptoms are fever, muscular pain, joints pain, rashes on body as well as feelings of nausea and vomiting. Besides this Dengue fever is a deadly complication for the heart patients (especially suffering from chronic heart diseases).

1.2 Dengue Fever by Region:

Dengue fever outbreak has been taking place in many countries of the world especially in diverse underdeveloped communities with poor hygienic system (Akram, et al. 1998). Majority number of cases has risen sharply and few cases reached near outburst magnitude. Dengue fever is well known disease for two hundred years ago (Itrat, et al. 2008). In very short time, this disease spread in many regions of the world especially in Southeast Asia, South America and various African countries (Guzman and Kouri, 2002). Despite this the number of people affected from Dengue fever increases day by day. In recent years there were more than 350 reported cases of Dengue fever and majority of them were male patients, children and aged persons. Majority of the Dengue victims were adults (age ranging from above 18 to 37 years). Accordingly 337 cases were categorized as special cases. While the cases registered during 2000 to 2008 belonged to three areas e.g. Southeast Asian countries namely Indonesia, Thailand and Philippines (Almeida, et al, 2009; Syed, et al. 2012). Dengue fever epidemics influence the abundance of inhabitants in Southeast Asia, Western Antagonistic regions, South Americans and various African States. The outbreak of Dengue fever has been increased drastically especially in American communities. In Latin America, Dengue fever was a unique disease before 1981. This disease spread rapidly in various areas of the world due to ecological and climatic changes (Pedro, et al. 2009; Vallee, et al. 2009).

1.3 Dengue Fever in Pakistan:

Southeast Asian countries are mainly responsible for the spread of Dengue fever in Pakistan. Many cases have been registered from various regions of India, Sri Lanka and Nepal. The first patient of Dengue fever was identified in Pakistan in 1994 (Carroll, et al. 2007). Afterward the outbreak of Dengue fever was reported in numerous areas of Pakistan for three following years 2006, 2010 and 2011 respectively. In last three years, there was an extraordinary outbreak of Dengue fever that has negative impact on the health of Dengue patients. Maximum Dengue victims were admitted in hospitals in Lahore and Karachi city. More than 40,000 patients with signs and symptoms of Dengue fever were admitted to numerous referral hospitals in Pakistan. Besides this more than 50 Dengue victims died and 37 patients got severely ill with various symptoms of Dengue fever in Sindh (Guzman and Kouri, 2002). The industrial sites of the country were reported to be the best place for breeding and spreading of Dengue virus (Almeida, et al. 2009; Kurane, 2010; Shamim, 2010). Irregular cases of Dengue Haemorrhagic Fever had been reported persistently from all over Pakistan after the identification of first case of Dengue fever. Antibodies: DENV-1 and DENV-2 were identified in serum of children presenting with indistinguishable Dengue fever in Karachi and these specific antibodies indicated that Dengue serotypes were predominating in era of 1990s in Pakistan (Akram, et al. 1998; Jamil, et al. 2007, Khan, et al. 2007). This epidemic was probably a consequence of DENV-3 introduction in population with prior exposure to DENV-1 and DENV-2, resulting in severe disease (Jamil, et al. 2007). Dengue fever outbreak spreads unsurprisingly in epidemiological pattern with normal outbreak of the Dengue virus with irregular cases of Dengue fever (Humayoun, et. al. 2010). The major outbreak of Dengue fever was encountered in upper regions of Punjab in 2003. In addition to this sporadic cases in Rawalpindi, Mangla, Peshawar, Abbottabad and Haripur were also reported.

2. Statement of Problem and Rational of the Research Study:

During the last few years Dengue fever became an epidemic in various regions of Pakistan. Due to its high cost of treatment it becomes an economic burden on Dengue patients' family. Despite this fact it is also becoming an impediment for assorted governmental actions to diminish the spread of Dengue fever in Pakistan. The outbreak of Dengue fever was more frequent in 2011 than in previous years. Consequently the socio-economic status of the Dengue patients family was disturbed due to Dengue epidemic (attributed to direct and indirect cost of treatment). Therefore the spread of Dengue fever was also amplified in other cities of the Punjab

e.g. Rahim Yar Khan, Multan, Gujranwala, Sahiwal, Faisalabad, Qasoor, Bahawalpur and Sadiqabad. This research paper deals with the effects of Dengue prevalence on the socio-economic status of the Dengue victims family in Lahore and Multan city. Thus the foremost statement of the predicament was:

"Effects of Dengue Incidence on Socio-Economic Status of Patient's Family: A Comparative Analysis of Multan and Lahore City (Pakistan)."

The researcher designed this study to explore the implications of Dengue incidence on socio-economic status of the Dengue victims family in Multan and Lahore city. Previous studies embark upon the relationship between Dengue fever and economic conditions of the Dengue victims family in diverse areas around the globe. However this study coalesces all the rationales about the spread of Dengue fever and its effects on Dengue victims family in a wide-ranging aspect. The substantiation of the study not only deals with the economic conditions but also with the underlying principles of disseminating the Dengue fever. Significant questions that will address during the course of this study are:

1. How the Dengue fever impinge on the social conditions of the Dengue victims and their families?
2. How the Dengue fever affects the economic conditions of the Dengue victims and their families?
3. What are the major determinants of direct and indirect economic burden on the Dengue patients and their families?
4. What are the foremost reasons of spread of Dengue fever among various regions of Multan and Lahore city?
5. What are the foremost remedies that can lessen the spread of Dengue fever?

3. Review of Literature

Guber, et al. (2001) explored the association between seasonal variations, probability of spreading the chronic Dengue fever and change in socio-economic status of the Dengue victims family. Gubler (2002) investigated that Dengue fever is explicable because Dengue fever is considered as a precarious disease in which a Dengue victim has a nonspecific epidemiological pattern. Over and above this the Dengue patient can suffer from permanent shocks that escort towards their life expiration within few days. Dengue victims and their families who experienced this rapid worsening endure various economic predicaments related with the expenditures of this disease. In addition to this the researcher revealed the implications of Dengue fever on financial conditions of the patients and their families. It is somewhat intricate to highlight the economic burden on families of Dengue patients. On the other hand Hairi, et al. (2003) has done a cross-sectional survey to gain awareness about the level of knowledge, attitude and practices adopted by the patients (and their families) regarding the cure of Dengue fever in rural communities. It was authenticated that the knowledge of the community was plead with epidemic outbreak of the Dengue fever. Clark, et al. (2005) analyzed that Dengue fever constitutes a huge economic burden on the families of Dengue patients. Besides this the researcher analyzed various aspects of the economic burden on the Dengue victim's family through direct and indirect expenses. The average expenses on the Dengue victims family is 61 $US that becomes sky-scraping economic burden on families of Dengue victims. Suarez, et al. (2005) described that vector borne diseases always targeted the public health. Thus the socio-cultural facts of the Dengue fever have been publicized to be central and have not been considered to elude various control programs. The researcher conducted this research between low and elevated income communities that mostly spend a lot of money on Dengue patients. Joshi, et al. (2006) claimed that pre-familial territory served as a determined source of Dengue virus that is particularly used for domestication of cows. In numerous communities the domestic pots in the open places (especially within low socio-economic strata) showed a higher container index. Thus these strata's have high potential of breeding the Dengue virus. Mosquitoes generally gather in plants, vessels and animals of this area, hence the chances of Dengue occurrence increases. Rigau- Peraz (2006) demonstrated a major fact about the Dengue fever in this research. Dengue fever imposed an intricate societal burden for evaluation because this disease has some imprecise symptoms that become severe with the passage of time. In addition to this there is lack of easily applied case descriptions for its additional severe signs. Carroll, et al. (2007) investigated that the sustainable public health campaigns, societal cooperation and affiliation from various associations are the significant factors for effective eradication of vector growth locations to prevent Dengue fever. The major requirement is that members of the community should comprehend the deteriorating impacts of this disease. In addition to this realization, diffusion and prevention activities can lessen the impacts of Dengue fever on socio-economic status of the Dengue patient's family. Khan, et al. (2007) depicted the association between the occurrence of Dengue fever and seasonal variables to accomplish an analytical equation that was approved for comparatively small communities. Besides this Mondini and Chiaravalloti (2007) evaluated that there is an association between the probability of Dengue epidemic spread and socio-economic strata (that is at the risk of this disease). Thus lack of an association between incidence of Dengue fever and socio-economic levels entails more research work on this incidence. This will be imperative to determine the spatial relationship between wide spreading Dengue fever

and socio-economic variables. Toledo, et al. (2007) conducted their research to evaluate the awareness level of the people towards the Dengue vector. Societal involvement is advocated as an indispensable agent for achieving victorious prevention against the outbreak of Dengue virus. Chaung, et al. (2008) concluded that practice, knowledge and attitude regarding Dengue fever are playing an imperative role in the epidemic outbreak of the Dengue fever in diverse places. The researcher described miscellaneous implications of Dengue vector and behavioral changes in attitude of families of affected patients. Despite this fact Garg, et al. (2008) illustrated that Dengue virus is a significant cause of mortality among the people. Due to its severity, this disease escorts towards bad economic effects in numerous developing countries. The researcher projected the economic burden faced by people in the third world countries during the incidence of Dengue epidemic. This research establishes that the expenditures of private health sector were very high as compared to the government hospitals. Dengue fever is one of the most crucial public health dilemmas which can be managed with active participation of the society. The pressure related with occurrence of Dengue fever amplifies day by day. Despite this fact the researcher also demonstrated that the inclusive economic and societal burden related with Dengue fever is not reported adequately. Itrat, et al. (2008) stated that the magnitude of the Dengue fever in Pakistan indicates a prominent awareness level and practices of the country's mature people regarding outbreak, precaution and spread of Dengue fever. Huy, et al. (2009) stated that majority of the infectious population (with Dengue fever) comprises of children. Economic burden of Dengue fever on patients family is high because of its treatment. The socio-economic status of family members could be disturbed due to impediments in health seeking behavior and capacity to pay for cost of treatment. Pedro, et al. (2009) investigated the precise conditions involved in spread of Dengue fever in various communities with the salient focus on socio-environmental factors and conditioning determinants. Beaute and Vong (2010) found that Dengue fever is widespread among various underdeveloped countries that are mostly deprived of basic health conditions. The family of the Dengue victims countenances many impediments in decision making process about their work activities and settling priorities. Socio-economic conditions of the Dengue fever patients got disturbed due to direct and indirect cost of hospitalization and aftermath of this disease. The cost of hospitalization for Dengue fever per day is sky-scraping due to their socio-economic status. In addition to this Humayoun, et al. (2010) stated that the medical and physical characteristics of patients with Dengue epidemiologic infection during 2008 epidemic in Pakistan tried to comprehend the clinical prototypes and severity of Dengue fever and awareness about the disease. Madiha (2010) investigated diverse determinants about the knowledge, attitudes and practices of selected mature population in Pakistan regarding Dengue fever. The researcher conducted a cross sectional survey in Karachi, Pakistan. The researcher concluded that knowledge about the Dengue fever is insufficient in low socio-economic groups. On the other hand better protective practices against the Dengue fever were prevailing in the elevated socio-economic groups. Khormi and Kumar (2010) stated that Dengue fever is one of the foremost epidemic outbreak diseases in South African and Asian regions. Human behavior has been reported to play an essential role in lessening the deteriorating consequences of Dengue fever. Thus proper awareness, adequate medication and spontaneous response towards various symptoms of Dengue fever can lessen the probability of Dengue occurrence. In this context Syed, et al. (2010) analyzed the Dengue outbreak in relation to socio-economic status with respect to geological regions. The researcher indicated the incidence of Dengue epidemic with socio-economic variables through Pearson's' correlation coefficient. Besides this the effects of Dengue fever are growing beyond the ecological, financial and physical conditions in various areas of the world. The researcher depicted that diverse parameters of the socio-economic status was also disturbed. The researcher elucidates the relationship between various causes of Dengue fever and the related socio-economic factors. In addition to this Amarasinghe and Letson (2012) conducted a research on outbreak of vector borne diseases (especially Dengue fever) and concluded that Dengue fever is the major cause of public health risk. Alternatively Dengue fever causes infections worldwide and threatens numerous people in the steamy regions. Dengue fever makes economic burden on the patients family regarding treatment and vaccination of patients. Despite this fact the direct and indirect cost of treatment of Dengue fever is high in developed countries. Since 2000, the government is trying to overcome this disease by providing the clean and safe water to rural communities. The major fact is that the prevalence and probability of Dengue transmission has increased worldwide, especially in Asia and Latin America since last 40 years but the environment of Middle East is not suitable for the breeding of Dengue vector. A significant option to prevent the spreading of Dengue vector is now under control to demolish mosquito breeding atmospheres.

4. Research Methodology

The notion of the present research was emerged during the uncontrollable situation of Dengue fever that was spreaded to raise the mortality rate and infections in Multan and Lahore city. The researcher visited the Dengue fever patients and interviewed them directly which intrigued the urge to comprehend the instability

regarding the socio-economic conditions of Dengue patients' family. The target population (Patients' family) was approached indirectly through informal discussions and unobtrusive observations.

Stage 1:

The researcher approached the hospitals of Multan and Lahore city that were diagnosing and treating the Dengue fever victims. Multan and Lahore city were the only active cities in Punjab that were dealing their surrounding regions (with Dengue epidemic) therefore the researcher searched out the list of the admitted patients in all hospitals that were dealing with Dengue fever in Lahore and Multan city.

Stage 2:

The researcher selected the patients by using Systematic sampling technique from the available list to get access to their families because patients were not the target population rather a source to approach their families. The researcher selected 200 patients (that were both male and female) from the list which was directed towards the sample of 200 families having one Dengue victim of any grade. So, the researcher visited the patients to reach their families and then interviewed them through interview schedule as a tool for data collection procedure. The interview schedule was constructed through the informal discussions that were conducted by the researcher with the Dengue patients. Afterward the researcher established the causal relationship among the study variables by coding the data in SPSS (version 17).

5. Results and Analysis

5.1. Demographic Profile of the Respondents:

Parameters	Category	Percent of Respondent
Age	13-20	28.0
	21-29	51.5
	Above 30 Years	20.5
Qualification	Illiterate	10.5
	Under Matriculation	39.0
	Under Graduate	34.0
	Post Graduate	16.5
Occupation	Student	23.0
	Business Man	16.0
	Private Job	33.0
	Government Job	28.0
Monthly income	1000-10,000	26.5
	11,000-20,000	38.5
	More Than 20,000	35.0
Family type	Nuclear	37.5
	Joint	62.5

Description of Demographic Profile of the Respondents:

Data was collected from the heterogeneous respondents to seek the factual results of Dengue incidence. Majority respondents (51.5%) belonged to the age group of 21-29 years (Mostly in this age group people are more affected by the Dengue fever as compared to any other age group). Over and above this majority of the respondents belonged to under Matriculation level qualification because low literacy rate leads towards less awareness about the health conditions. In addition to this, majority of the respondents belonged to medium class income group. The data was taken from each unit of the group of monthly income (through interview schedule). Out of 200 respondents as mentioned in Table no. 1, there were 46 Students, 32 Business Man, 66 Private Job holders and 56 Government job holders. Majority of the respondents had under Matriculation level qualification (39.0%) and 10.5% respondents were illiterate. On the other hand 38.5% respondents had the monthly income of 11,000- 20,000 rupees (table 1). In addition to this, the table also illustrates that 62.5% respondents belonged to joint family system and 37.5% respondents belonged to nuclear family setup (Table 1).

5.2. Grades and Symptoms of the Dengue fever:

Grades Of Disease	Symptoms of Grades	Frequency	
		Male	Female
Grade I	Fever, non-specific symptoms, positive tourniquet test and/or easy bruising.	35	11
Grade II	Spontaneous bleeding in addition to the manifestations of grade I.	38	07
Grade III	Circulatory failure manifested by rapid, weak pulse, and narrowing pulse pressure or hypotension.	40	10
Grade IV	Profound shock with undetectable blood pressure and pulse.	36	23
Total		**149**	**51**

Description of Grades and Symptoms of the Dengue Fever:

The above cited table depicts the grade of Dengue disease, its symptoms and total number of victims' families. Thus 35 males and 11 females diagnosed the first Grade of the disease as it is the initiative stage of Dengue fever. On the other hand, 38 males and only 7 females diagnosed the second grade of the disease. In this grade of disease, spontaneous bleeding starts from the nose of the patients. Subsequently, 40 males and only 10 females experienced Grade-III of the disease. In this grade of disease, there were less platelets in the patients' body, weak pulse rate and extensive hypotension. These symptoms demonstrate the severity of Dengue fever. In addition to this 36 males and 23 females experienced the fourth grade of the disease. In this table, majority of the patients were males. In addition to this many children were present in this affected population. Economic burden of Dengue fever on patients family was high because of its treatment. Consequently the socio-economic status of the Dengue victims family was disturbed due to its high cost of treatment.

5.3. Determinants of direct and indirect economic burden on the Dengue patients and their families:

Determinants of family's cost on Patients	Categories	Male Patients/ family	Female patients/family
Direct Cost			
Doctor's Visits	100-300 PKR	14.1%	5.8%
	400-600 PKR	53.7%	49.0%
	700-900 PKR	20.8%	31.4%
	More than 900 PKR	11.4%	13.7%
Medication	100-300 PKR	8.7%	5.9%
	400-600 PKR	36.2%	29.4%
	700-900 PKR	40.9%	49.1%
	More than 900 PKR	14.1%	15.7%
Lab. Tests	100-300 PKR	14.7%	11.8%
	400-600 PKR	65.1%	66.7%
	700-900 PKR	18.8%	21.6%
	More than 900 PKR	1.3%	0.0%
Indirect Cost			
Income disturb of the caretaker	100-300 PKR	14.1%	5.9%
	400-600 PKR	53.7%	49.0%
	700-900 PKR	20.8%	31.4%
	More than 900 PKR	11.4%	13.7%
Food expenses	100-300 PKR	13.4%	9.8%
	400-600 PKR	37.6%	31.4%
	700-900 PKR	30.9%	37.3%
	More than 900 PKR	18.1%	21.6%
Transportation Expenses	100-300 PKR	13.4%	9.8%
	400-600 PKR	26.8%	19.6%
	700-900 PKR	17.5%	11.8%
	More than 900 PKR	42.3%	58.8%

Description of determinants of direct and indirect economic burden on the Dengue patients and their families:

Information revealed from the above mentioned table bestows an idea about the direct and indirect cost of treatment that was spent by the family members on Dengue victim. It is evident that 49.0% female respondents and 53.7% male respondents spent 400-600 PKR on doctors' visits during the treatment of the Dengue fever. In addition to this 49.1% female respondents and 40.9% male respondents spent 700-900 PKR on medication during the treatment of the Dengue fever. Over and above this 66.7% female respondents and 65.1% male respondents spent 400-600 PKR on extra laboratory tests to diagnose the grade and severity of the Dengue fever. This cost is for the diagnosis of the disease but mostly the female patients make use of self-medication and avoid the direct and indirect expenses on this disease. Afterward the above mentioned table reveals that 49.0% female respondents and 53.7% male respondents spend 400-600 PKR on the treatment of Dengue fever. The respondents in the above mentioned table argued that they disturbed their income level due to over expenditure on Dengue fever (because care takers/parents/guardians stayed in the hospital to look after the Dengue patients). Hence 37.6% male respondents spent 400-600 PKR (especially on food items) on the Dengue patients when they were admitted in the hospitals. Alternatively 37.3% female respondents spent 700-900 PKR on food items during the patients stay in hospital. The above mentioned table also demonstrates that 58.8% female respondents and 42.3% male respondents spent more than 900 PKR on transportation expenditures during the Dengue victims stay in the hospital.

6. Hypothesis:

1. *The Dengue patients of Lahore city faced more economic burden (direct cost of expenditure) as compared to Dengue patients of Multan city.*
2. *The Dengue patients of Lahore city faced high expenditure on food items as compared to Dengue patients of Multan city.*
3. *The social role of the patients who belongs to Lahore city is highly disturbed as compared to patients who belong to Multan city.*

Hypothesis Testing No. 1

Mean, Standard Deviation and t-value for the patients living in Lahore city (n=100) and Multan city (n=100) for direct expenses (n=200) (Direct Cost).

Variable	City	N	M	SD	T	P
Extra Laboratory Tests	Lahore	100	1.930	0.807	3.88	0.000***
	Multan	100	1.530	0.643		

*(df=198, *** p<0.01)*

Discussion of Hypothesis Testing No. 1:

The above mentioned table illustrates the score for the expenses that was spent on extra laboratory test for diagnosing the Dengue fever in Lahore and Multan city. The results demonstrate that patients who live in Lahore city spend more money on laboratory tests as compared to patients who live in Multan city. As Lahore is a gigantic city, therefore the average cost of medication on Dengue fever is high as compared to Multan city. Direct cost (Laboratory tests, Medication, Hospital bills, Doctor visits) and the expenses of diagnosing the Dengue fever by laboratory tests was approximately more than 300 rupees (for one time) in Lahore city. The largest average single expense was spending on the initial doctor visit by the Dengue patient. This disbursement is often larger than the entire hospital stay. After completing the treatment period, the patients recheck their platelets through laboratory tests. Thus these patients again repay for the laboratory test. The cost of treatment amplifies extensively with the severity of the disease and intensity of treatment. Direct cost included out-of-pocket limit expenditure by affected households (e.g. transport costs to the health centers, private consultations and medicines). Doctor's fee, medication prior to admission in hospital, laboratory tests and various other expenditures were high in Lahore city. Due to these factors, the economic conditions of the patients were disturbed in Lahore city as compared to Multan city. On the other hand, same test fee in Multan city was 100 rupees (at one time) and other expenditures were also less than Lahore city (related to medication, laboratory tests and direct cost on disease). So, the economic burden of Dengue fever has significant unconstructive impact on the Dengue victims of Lahore city. Paul, et al. (2001) stated that the interaction with the friends, family and social network could be decreased among the Dengue victims due to Dengue fever. The alterations that were taking place within the societies and cultures in which we live are immense and multifaceted. Pertaining to human society, the interactions between the individual, group and wellbeing of human beings includes age

structure, usually occupational possibilities and population movements that were not present as cultural traits (*df=198, t*=3.88, *p*=0.000*)*.

Hypothesis Testing No. 2

Mean, Standard Deviation and t- value for the patients living at Lahore (n=100) and Multan (n=100) for indirect expenses (n = 200).(Indirect Cost)

Variable	*City*	*N*	*M*	*SD*	*T*	*P*
Food Expenses	Lahore	100	3.22	1.19	2.15	0.015*
	Multan	100	2.85	1.24		

*(df=198, *p<0.01)*

Discussion of hypothesis testing No. 2:

The above mentioned table demonstrates the score of expenses (indirect cost) that was spent on food items among patients living in Lahore and Multan city. The results illustrate that patients who live in Lahore city spend more income on food items as compared to the patients who live in Multan city. As Lahore is a big city and also capital of the Punjab province, that's why there is a little difference among the basic necessities of life. The prices of the basic necessities of life is very high during the Dengue epidemic, therefore the bread earner sometimes move away from the work (indirect cost of treatment of the Dengue fever) due to absence of work due to illness and weakness from Dengue fever. Indirect cost embraced loss of income related to absence from work due to Dengue fever. Loss of income is a substantial expense because the patient's family takes care of washing, feeding and looking after the victims. Usually these responsibilities are not done by the staff. Thus most parents lose their entire income during the time of admittance of their family members in hospitals for the cure of Dengue fever. Dengue incidence has influential impact on the socio-economic condition of the patient's families in Lahore and Multan city. Clark, et al. (2005) stated that average duration of illness due to Dengue fever is 15-20 days in the hospitals for the treatment. In addition to this the researcher also discussed that Dengue victims were also admitted in the normal ward of the hospital *(df*=198, *t*=2.15, *p*=0.015*)*.

Hypothesis Testing No. 3

Mean, Standard Deviation and t- value for the patients living at Lahore (n=100) and Multan (n=100) for their social status (n = 200).

Variables	City	n	M	SD	SE. Mean	T	P
Social Status	Lahore	100	32.99	6.19	0.62	2.86	0.002***
	Multan	100	30.33	6.94	0.69		

(df=198,***p<0.01)

Discussion of hypothesis testing No. 3:

The above cited table illustrates the results of the social status that disturbs the patients who belong to Lahore city in 2011 due to Dengue incidence. P-value in the above mentioned result indicates that the social status of the patients was highly disturbed in Lahore city (Pakistan) as compared to patients of Multan city. During this epidemic disease, the social activities of the people were disturbed in all over Punjab but especially in Lahore city as compared to Multan city. Despite this fact the interaction of Dengue patients was also disturbed with their family, relatives and friends during the Dengue disease. This disease has physical, psychological and economic influence on the patients and their families. They changed their living styles, dressing patterns, food stuff and numerous other cultural aspects. The living patterns of the people in Multan city was disturbed radically due to Dengue epidemic. Toledo (2007) illustrated that the socio-economic conditions of the patients family was disturbed due to Dengue incidence. Huy, et al. (2009) stated that the economic burden of Dengue fever on patients family is high because of its cost of treatment. As a result of this there is a drastic fluctuation in the socio-economic status of the Dengue patients family *(df*=198, *t*=2.86, *p*=0.002****)*.

7. Conclusion

After revering the analysis vigilantly the researcher concluded that the socio-economic status of the Dengue patient's family could be disturbed due to this epidemic outbreak. This study approved that vector borne

diseases (especially Dengue virus) was the major cause of outbreak of febrile illness in Lahore and Multan city (Pakistan). The economic status of the Dengue victims' family was agitated due to its high cost of treatment. Indirect expenditure spent on Dengue fever treatment is the foremost cause of interruption about the economic status of Dengue victims' family. During Dengue epidemic considerable economic losses were borne by developing countries like Pakistan owing to a single preventable viral disease. There may be enormous variations in the total economic encumber on macro level in Pakistan depending upon the severity of the disease in reported and unreported cases. However the accurate calculations of these variables were urgently needed to be more assured of the exact economic burden of Dengue fever on patients family. This has an immense implication for limited health budget and financial resource availability for managing other communicable and non-communicable diseases. Thus Dengue fever has far-reaching influence on the socio-economic status of the Dengue patients and their families.

8. Suggestions

The following suggestions can be used to lessen the deteriorating impacts of Dengue incidence on the socio-economic status of the Dengue victims and their families.

8.1. Future Scholarly Research Grounds:

There are some areas that must be studied by the prospect researchers about the Dengue incidence:

1. Further researches should be conducted on the detailed contextual causes of breeding Dengue virus in Pakistan.
2. Further researches should be done on the phenomenon of spreading Dengue fever in a holistic manner.
3. Further researches should be conducted on the impediments faced by the government in eradicating the incidence of Dengue fever.
4. Further researches should be done on the societal reaction and practices towards the evasion of Dengue incidence.
5. Further researches should be done on the knowledge and awareness of people to eradicate the Dengue epidemic in various areas.
6. Further researches should be done upon the significance of seasonal variation and incidence of Dengue fever.

8.2 Practical level

8.2.1 Community Level

1. People should change water in vases on alternate days. This will be the best practice that can lessen the implications of this disease at the community level.
2. People should confiscate water from pots on alternate days.
3. People should turn over all pails and water storage containers.
4. Community members must ensure the cover cane pole holders when not in use.
5. People should clear blockages and put insecticides in roof gutters monthly.
6. People should cover toilet bowls and floor traps when not in use.
7. People should use mosquito coils because it can diminish bites by repelling and killing mosquitoes.
8. Synthetic insecticides containing coils should only be used in well-ventilated areas to lessen the spread of this disease.
9. Those people that travels a lot from one city to another should protect themselves from mosquito bites because the mosquitoes that spread Dengue usually bite at dusk and dawn (but they may bite at any time during the day), especially in shady and cloudy places (in urban and rural areas).
10. Travelers are advised to stay in hotels or resorts that are well screened. This will be beneficial to reduce the mosquito growth.
11. People should sleep under bed nets to prevent mosquito bites especially when the buildings are not well scanned.
12. People should use mosquito repellant sprays that include DEET as the foremost insect repugnant.
13. People should try to wear long sleeve shirts and pants along with socks and shoes for additional protection against the Dengue fever.
14. People should ensure that the home windows and door screens are safe and without openings.
15. People should try to sleep indoor so that the incidence of Dengue epidemic can be eradicated.
16. Papaya juice can be very beneficial to perk up the performance of immune system by enhancing platelets count which eventually alleviates the Dengue fever.
17. Rice gruel are the excellent remedy for Dengue patients.
18. The patients suffering from Dengue fever should evade all kinds of spices in their diet.
19. Porridge can be given to the Dengue patients during the period of disease.

8.2.2. Government Level

1. Government should ensure the community involvement in removing mosquito-breeding sites.
2. Government should make different strategies to eliminate mosquitoes in Dengue outbreak areas by using quality insecticides and effective strategies to eliminate the Dengue outbreak.
3. Government should take timely and appropriate action regarding hospital management especially in Punjab Province.

8.2.3. Mass Media

Mass Media is a major and paramount source for the government to convey an indispensable message to community about the precautions taken by the people during the Dengue epidemic. The foremost sources of the mass media are as follows:

1. Radio
2. TV
3. Newspapers
4. Campaigns
5. Posters
6. Banners

8.2.4. Surveillance: Identify Outbreak Areas

1. Usage of integrated vector control strategy.
2. Use larviciding, indoor residual spray and fogging in houses in 500 meter radius from confirmed cases.
3. Use quality insecticide (WHO prequalified).
4. Careful fluid management by trained and experienced nurses and doctors.
5. Surveillance and outbreak response with vector control in hotspots.
6. Case management at hospital level.
7. Prepare and aware the people about the next outbreak of the Dengue fever.

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